

Watershed project highlights

The number of watershed projects completed in 2020 were limited. The prominent reason was the Covid-19 pandemic. We anticipated all projects from fiscal year 2016 to be completed and about a 50% completion rate in 2017. What we saw was a 76 and 33% completion rate, respectively. Those that did complete on-time were ahead of schedule and not impacted by the pandemic.

This report highlights three successful projects, two of which are associated with WBPs previously discussed. Our 2016-2020 project list and their status are provided in *Appendix 3*.

Success Stories

The 2020 stories are not the typical US EPA success story, but this was not the typical year. These include a story about Muddy Creek for US EPA's 50th anniversary, a story about the integration of source water protection plans and watershed based plans, and finally a testimonial from a Browns Creek resident.

Back Creek protection

Organization(s):	WV Conservation Agency, Blue Heron Environmental Network	Contact:	Kristen Bison
<u>Watershed information</u>			
HUC8:	02070004	Stream code:	WVP-6
HUC12:	020700040404, 020700040406, 020700040407, 020700040408, 020700040409	GRTS:	FY16 #10

Project overview

This project is in the Back Creek watershed of the Potomac Direct Drains watershed in Berkeley County and Morgan County. Back Creek is one of the few watersheds in the eastern panhandle that does not have water quality impairments on the 303(d) list, which has made this watershed a priority area for conservation for the WVDEP-WIB, WVCA, EPCD, BHEN, WVDF, [Upper Potomac River Keeper](#) and the Chesapeake Bay Program.

This project was intended to promote conservation through the acquisition of 100 acres of conservation easements on priority agricultural parcels, reduce erosion by 0.92 tons/year of sediment through natural stream restoration of 915 feet, inventory and prioritize sediment producing dirt and gravel roads, assessing physical stream conditions using [The Easy Assessment Method](#) (TEAM) and gauge program effectiveness through water quality monitoring. Further nutrient and sediment reductions were a goal by providing targeted outreach and promoting USDA Farm Service Agency's [Conservation Reserve Enhancement Program](#) CREP. CREP is a federal cost-share program for riparian forest and vegetative buffer establishment, alternative watering, fencing, and stream crossings.

Problem description

Back Creek is one of only very few watersheds in the Eastern Panhandle that does not have water quality impairments. However, continued development from urban sprawl, timbering and agricultural practices are future threats. As a result, the Back Creek WPP was developed and approved by USEPA in 2014 to focus restoration efforts and enable financial and technical assistance to facilitate improvement strategies and restoration projects in the Back Creek watershed. Protection of forest, wetland, and farmland properties as well as natural stream design (NSD) were identified as priority management actions for the watershed.

Project highlights

The original grant deadline was extended due to delays in one of the conservation easements purchases and the stream restoration project.

Conservation easements

A postcard was distributed to the entire Back Creek watershed to promote the conservation easement program. BCFPB received four applications and ranked the properties according to the ranking criteria detailed in the project work plan. Two properties were selected for conservation easement purchase: one property consisting of 60 acres with 2,600 feet of frontage on Back Creek and another property consisting of 95 acres. These 155 acres exceeded the original goal of 100 acres. The closing for the first easement was completed in April 2018, and the closing for the second easement was finalized in December 2018.

Figure 8. Conservation easement postcard.



Stream restoration

The stream restoration project is located near Tuscarora Pike outside the community of Shanghai, WV. Most of the project was completed on the Butts property, which is used primarily for crop production; this property had been placed into conservation easement by the current landowner. The streambank on the opposite side belongs to Broomgrass HOA. The portion of Back Creek flowing through these properties has areas of lateral erosion, which contributed excess sediment to the creek.



Location of stream restoration project (looking at the Butts property, river left, from the Broomgrass HOA side, river right).

The stream restoration design, permitting, and project oversight were completed by WVCA staff. In 2016, flooding in the southern part of the state delayed the design and permitting stage of this project because watershed division staff were engaged in flood response activities. By August 2018, the design had been completed, a contractor selected, and most of the permits had been obtained. However, the WVDNR was unable to perform the required mussel survey in 2018. The survey was completed in June 2019 and the project was cleared. The contractors completed the work in 2019 and 2020.



Regrading of bank on river left.



Grass growing ~ 3 weeks post project.

The design included the installation of one j-hook, the installation of toe wood on the river right bank, and the regrading of the river left bank downstream of the j-hook. The disturbed areas were stabilized with coir fiber matting and grass seeding. Live stakes and trees will be planted during the dormant season this year to stabilize the banks and to restore the riparian buffer.

TEAM assessment

Using the TEAMS method, WVDEP summer interns completed inventories of eroded streambanks in the watershed, focusing on one subwatershed at a time. In addition to assessing streambanks, interns collected GPS coordinates and created maps of priority sites, primarily focusing on erosion and inadequate buffers. Priority areas include: One Spring Run (also known as Town Run), Elk Branch, Sawmill Run, Tub Run, Gough's Run and White's Run, a tributary of Tilhance Creek.

Obstacles

1. **Dirt and gravel roads assessment** - CB funds originally intended for the Dirt and Gravel Roads assessment did not take place. [Cacapon Institute](#) was still interested in holding a Dirt and Gravel Roads assessment, but the activity did not occur during this phase.
2. **Volunteer monitoring** - Due to the retirement of staff previously tasked with developing the volunteer monitoring QAPP, the QAPP was not developed for BHEN volunteer monitoring program. Additionally, BHEN is currently inactive, so alternatives for water quality monitoring and QAPP development will be explored during the Phase III project.

Results

Table 9. Load reduction estimates for Back Creek stream restoration.

Back Creek Phase II results		
Pollutant	Stream length	Load reduction
Sediment	915 linear ft	0.92 tons/year

155 acres of farmland were placed into conservation easement, which exceeds the original goal. One of the properties includes 2,600 feet of stream frontage along Back Creek. The protection of both properties will help mitigate some of the development pressure that threatens the excellent water quality of Back Creek.

The completion of the stream restoration project along the Butts and Broomgrass properties will reduce an estimated 0.92 tons of sediment/year from entering Back Creek.

Beaver Creek at Auman Rd

Organization(s):	Friends of the Cheat	Contact:	Madison Ball
<u>Watershed information</u>			
HUC8:	05020004	Stream code:	WVMC-12-B-1
HUC12:	050200040603	GRTS:	FY16 #8

Introduction

Beaver Creek is a tributary within the Big Sandy Creek watershed, which hosts a viable fishery and is nationally renowned for river recreation. For these reasons, FOC and its partners have targeted restoration activities in the watershed since the late 1990s. FOC had already implemented two projects in the Beaver Creek watershed, including Big Bear and McCarty Highwall passive AMD treatment projects, and completed the Big Sandy Creek WBP in 2019.

Problem

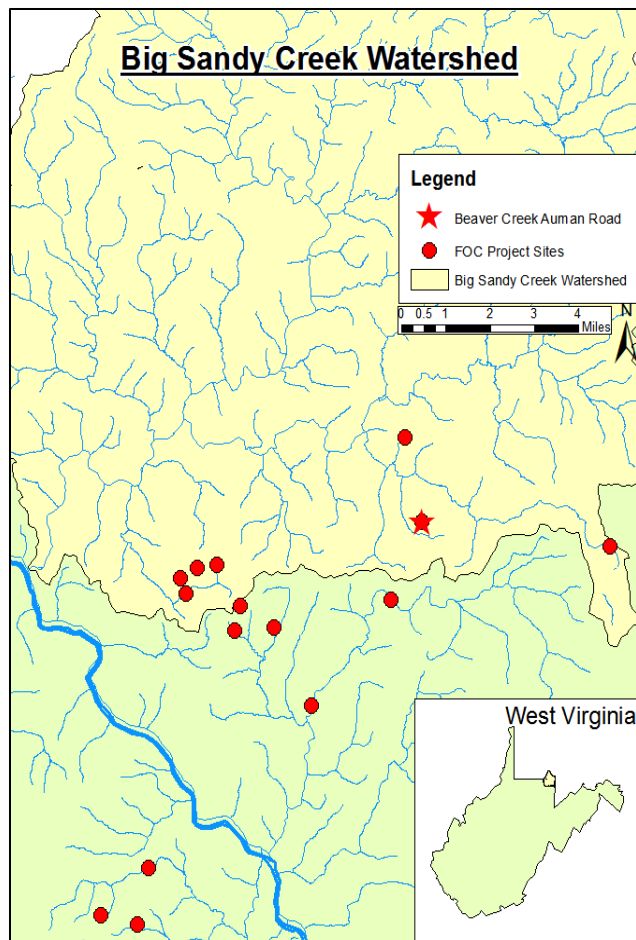
The seeps associated with the "Beaver Creek at Auman Road" projects contribute some of the highest acidity, aluminum, and iron loadings to the Beaver Creek watershed, and have been identified as priorities for treatment via FOC's Big Sandy Creek WBP and have been on FOC's radar for treatment since 2009. Because the previous landowner was not interested in treatment, FOC was unable to pursue treatment for many years until the property changed ownership.

The project, a major priority for FOC, had experienced many challenges throughout the project duration, including a lengthy permitting process (the USACE permitting process alone took approximately 1 year from submission to approval), landowner complexities, attempting to accomplish the work during COVID-19, and construction cost overages.

Project highlights

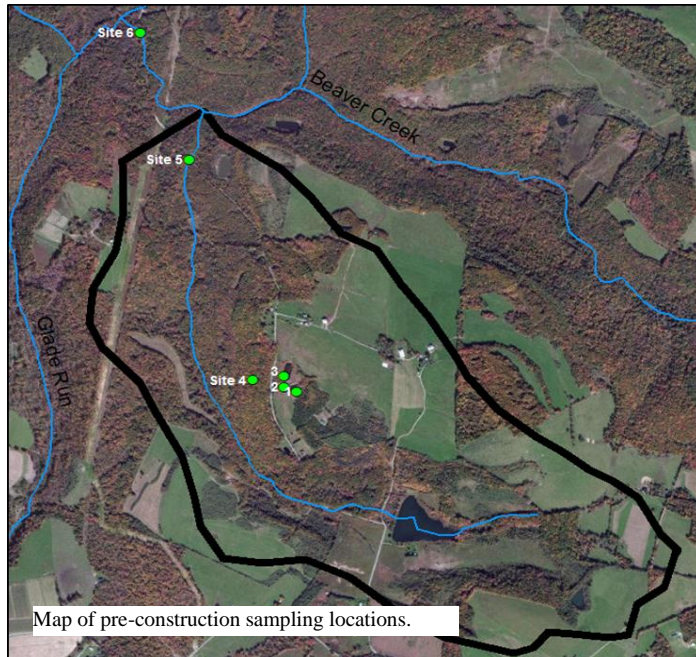
In October 2019 FOC announced a bid opportunity for the project for construction, at which time all bids were over-budget, with the lowest bid being \$115,628 over-budget. During the previous reporting period, FOC consulted with Civil & Environmental Consultants (CEC), WVDEP, and various firms to determine why the bids were so high over the opinion of probable cost (OPC). It was determined that the OPC did not factor in some critical concerns, and no local quarries at that time were producing high calcium carbonate limestone. FOC sought and secured additional funding (\$115,628) to cover this overage with the 319 program and split the project between Phase I and Phase II. CEC in conjunction with FOC held a second pre-bid meeting to procure a construction contractor for the project in February 2020. A contractor was awarded, and an agreement was signed in March. During the final project period, FOC constructed the upper and lower passive AMD treatment systems at Beaver Creek of Auman Road. Construction was completed in July, although the planting effort was postponed until October to increase the chances that the tubelings and potted plants would survive and would not dry out in the hot summer months. A budget amendment for NPS 1725 was also approved, which allowed FOC to move \$8,800 to Personnel to provide construction oversight and post-construction monitoring, \$2,250 for laboratory fees to continue post-construction monitoring in 2021, and \$1,200 in operating costs.

Figure 9. Map of Big Sandy Creek watershed showing FOC project locations.



Pollutant reductions

Initial water quality results show dramatic improvements and a 100% reduction in acidity, and 80% or greater reduction in aluminum for AMD source that feeds the lower treatment system. Iron reductions of the lower treatment system are near 67%, and FOC anticipates the reduction will increase once wetland species establish in the wetland. Ultimately load reductions of 4091 lbs/year of acidity, and 494 lbs/year of aluminum have occurred at the upper treatment system; 32,543.1 lbs/year of acidity, 3,335 lbs/year of aluminum, and 518.20 lbs/year of iron reductions have occurred at the lower system.



UNT/Beaver Creek RM 1.7 is recorded as having load reductions of 99,082.6 lbs/year of acidity and 2,069 lbs/year of aluminum. There has been an increase in iron (437.2 lbs/year). FOC is unsure of this source of iron but will continue to monitor UNT/Beaver Creek RM 1.7 to see if the increased iron is an anomaly or a trend. While water quality monitoring of the upper treatment system is showing that it is reducing acidity, aluminum, and iron loads by 80% or greater, there has not been a significant change to the pond on site. However, the seep that feeds the upper system has been dry for most of the sampling events, or near dry. FOC is interested in tracking water quality changes in the pond during high flow months in March and April of 2021. Water quality monitoring of the site continues, and the tree planting component of the construction plan took place in October 2020. FOC plans to monitor success of the planting in the future.

Table 10. Loadings in pounds per year for water quality parameters pre and post construction at monitoring locations for the Beaver Creek at Auman Road project. Samples were collected on 3/20/2020 and 8/20/2020. ND represents non-detectable concentrations.

Site	Acid loading lbs/year	Alkalinity loading lbs/year	Diss. Al loading lbs/year	Total Fe loading lbs/year
Auman upper seep	4,091	ND	494	ND
Auman upper limestone bed	-12.32	30.6	ND	ND
Load reduction	4091		494	
Auman lower seep	32,543.1	ND	3,335.1	521.2
Auman lower system wetland	-42.51	100.24	0.14	3.03
Load reduction	32,543.1		3,335	518.2
UNT/Beaver Ck RM 1.68 mouth	99,149.1	ND	2,069	ND
UNT/Beaver Ck RM 1.68 mouth	66.5	ND	ND	437.2
Load reduction	99,082.6		2,069	-437.2



Beaver Creek at Auman Road Lower System Post Construction



Beaver Creek at Auman Road Upper System Post Construction

Partners and funding

Most of the funding was secured through the USEPA's §319 Program, specifically NPS-1584 Phase I and later, NPS-1720 Phase II), as well as a Department of Interior – Office of Surface Mining (OSM) [Watershed Cooperative Agreement Program](#) (WCAP) grant. Match was provided by FOC, CEC, and volunteer match. FOC provided match in the form of additional funds for personnel as well as operating costs.

Table 11. Final Beaver Creek at Auman Rd project budget

	\$319 NPS 1584	OSM WCAP	Non- Federal Match	FOC	Phase I Total	\$319 NPS 1725	Phase I and II Total
Implementation							
Personnel and Benefits	\$ 22,950	\$ 4,500	\$ -	\$ -	\$ 27,450	\$ 8,800	\$ 36,250
Equipment and Supplies	\$ 2,208	\$ -	\$ -	\$ -	\$ 2,208	\$ -	\$ -
Subcontracts	\$ 111,958	\$ 126,525	\$ -	\$ -	\$ 238,483	\$ 103,378	\$ 341,861
Engineering	\$ 36,308	\$ -	\$ -	\$ -	\$ 36,308	\$ -	\$ -
Construction	\$ 75,650	\$ 126,525	\$ -	\$ -	\$ 202,175	\$ 103,378	\$ 305,553
Travel	\$ 1,417	\$ -	\$ -	\$ -	\$ 1,417	\$ -	\$ 1,417
Lab Fees	\$ 9,125	\$ -	\$ -	\$ -	\$ 9,125	\$ 2,250	\$ 11,375
Non-Implementation	\$ 34,000	\$ -	\$ -	\$ 14,000	\$ 48,000	\$ 1,200	\$ 49,200
FOC Operating Costs	\$ 17,000	\$ -	\$ -	\$ 14,000	\$ 31,000	\$ 1,200	\$ 46,200
Non-point Source Monitoring and Planning Activities	\$ 17,000	\$ -	\$ -	\$ -	\$ 17,000		\$ 17,000
Total	\$ 181,658	\$ 131,025	\$ -	\$ 14,000	\$ 326,683	\$ 115,628	\$ 440,103

Browns Creek Phase I

Organization(s):	Coal River Group, WV Conservation Agency	Contact(s):	Justin Hunt, Bill Curry
<u>Watershed information</u>			
HUC8:	05050009	Stream code:	WVKC-2
HUC12:	050500090608	GRTS:	FY16 #5

Project overview

The Browns Creek and Angel Fork -Coal River watershed is defined by the U.S. Geological Survey (USGS) as 12-digit HUC (050500090608) and is included in the Coal River TMDL. The Lower Coal River watershed makes up the northern-most reach of the Coal River watershed and includes the mouth of the Coal River at St. Albans, WV.

This HUC12 area drains 14,371 acres in Kanawha and Putnam counties. Unfortunately, there is no plan to extend public sewer to Browns Creek or Angel Fork like surrounding areas. CRG hosted educational outreach events to discuss the Browns Creek septic project and develop a relationship between contractors and homeowners with failing septic tanks. Sixteen tanks were successfully replaced, and four septic tanks were pumped between September 2015 and June 2020. The project concluded with a substantial waiting list. In 2019, CRG applied for an additional watershed project grant to continue its work reducing fecal coliform bacteria from the Lower Coal River watershed. This will be known as the Browns Creek Phase 2.

Problem

Fecal coliform bacteria pose a major issue throughout the entire Coal River watershed. According to the 2006 TMDL for the Coal River the area faces some of the most serious fecal coliform problems in the entire Coal River watershed. Failing onsite wastewater treatment systems pose the most significant nonpoint source of fecal coliform bacteria in the Lower Coal River watershed. Biological impairments are also prevalent in the watershed but are a secondary concern currently. In some cases, biological conditions will improve once the increased enrichments from failing septic's are reduced.

In April 2015, Kanawha Charleston Health Department (KCHD) conducted a comprehensive sanitary survey of Browns Creek area (consisting of the Upper Browns Creek and Angel Fork sub-watersheds). The survey verified the functionality of only 27% of onsite home sewage treatment systems and documented over 60% as failing or non-functioning at the time of the survey. Of the 378 homes in the area, 301 homes are on septic systems and 67 are served by home aerator units (HAUs). The survey also identified instances of straight pipes discharging sewage directly into Browns Creek.



CRG staff and volunteers recruiting homeowners for septic tank replacements.

Project highlights

During the grant period, 16 homeowners replaced their failing septic systems, which exceeds the number of replacements sought in the original workplan. All homeowners replaced their failing systems with traditional absorption field septic systems. Concrete and plastic tanks were used depending on KCHD recommendations. The replacements were successful due to the recruiting of the homeowners. To start the grant period the CRG hosted homeowners, contractors, and consultants at the CRG building to educate and recruit homeowners for the program. Outreach continued throughout the grant period with signage, social media, and direct mailing

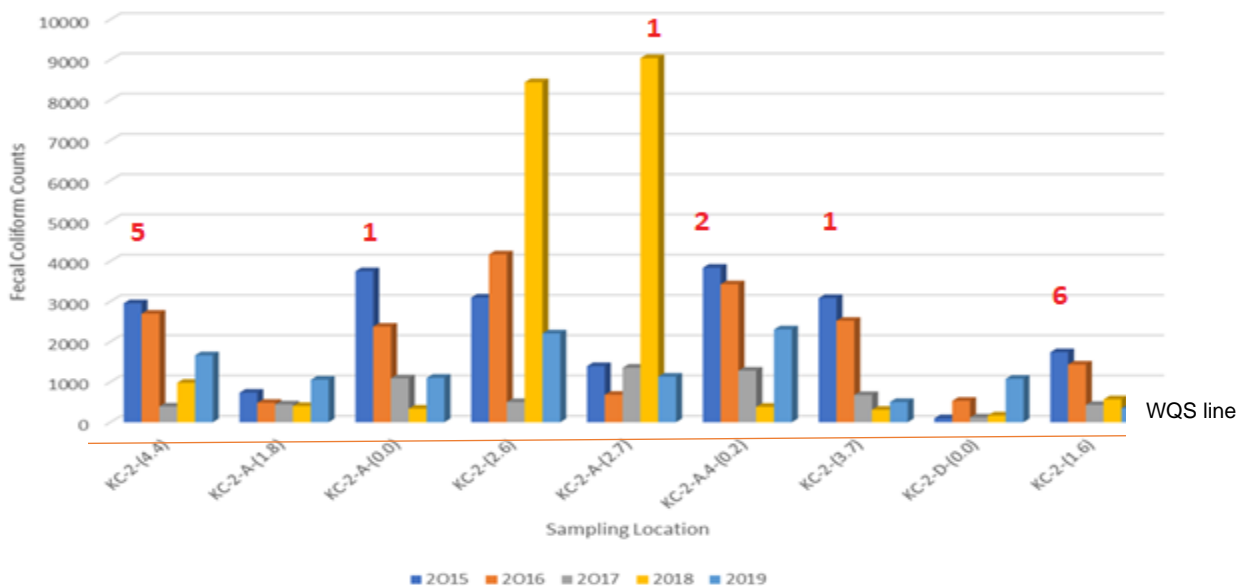
methods. The other aspect of the grant was the septic pump-out portion. A goal of 30 pumping's where also part of the effort, but CRG discovered that most homeowners need the complete replacement rather than simple maintenance. A total of four homeowners had a functioning septic tank and had their septic tank pumped.

Figure 10. Septic work in the Browns Creek watershed.



Results

Figure 11. Fecal coliform monitoring in Browns Creek.



Monitoring has been conducted since before the project started. Results are shown in [Figure 10](#).

In the graph you will notice some locations with gradually reduced fecal counts. A red number above each sampling location shown indicates the number of septic tanks that have been replaced immediately up-stream of the location. Thus far, water quality data indicates the higher number of septic tanks replaced upstream the lower fecal counts are downstream. Overall, the water quality data indicates improvement in some locations but other areas need attention.

With sixteen septic tanks replaced and four septic tanks pumped out; fecal coliform counts are progressively decreasing in the Browns Creek and Angel Fork tributaries. The CRG outreach strategy has recruited more than 25 residents for NPS-1619, and now have a waiting list for NPS-1710.

The estimated load reduction progress thus far is 2.63E+13.

Partners and funding

Browns Creek Phase 1 remediation project started in 2016 through a \$319 watershed project grant provided by WVDEP's Nonpoint Source Program. KCHD is a valuable partner. They evaluated all home septic systems for participating homeowners. They made recommendations on the best systems each site needed and inspected the site following installation. The fiscal agent for the project was WVCA. WVCA conducts the payments directly to the contractors for each project. This was an enormous benefit for the CRG, which alleviated the pressure of needing the funds upfront for each project and it reduced turn around time on reimbursements. WPP funding has supported CRG project management and monitoring staff, and of course willing landowners are critical to the project success.

CRG quickly learned that the focus of most funding needed to be on replacement/repair. Funds were moved from other categories to make sure implementation was the focus. This is critical to the overall success of the effort.

Table 12. Browns Creek NPS-1619 expenditures.

Items/tasks	Award	Match	Final expenditures
Education/outreach	\$3,500.00	\$2,333.00	\$1,099
Tank replacements	\$80,000.00	\$53,334.00	\$86,705.00
Tank pump-outs	\$6,000	\$4,000.00	\$800
Water sampling	\$4,500.00	\$3,000.00	\$5,396
Totals	\$94,000.00	\$62,667.00	\$94,000.00

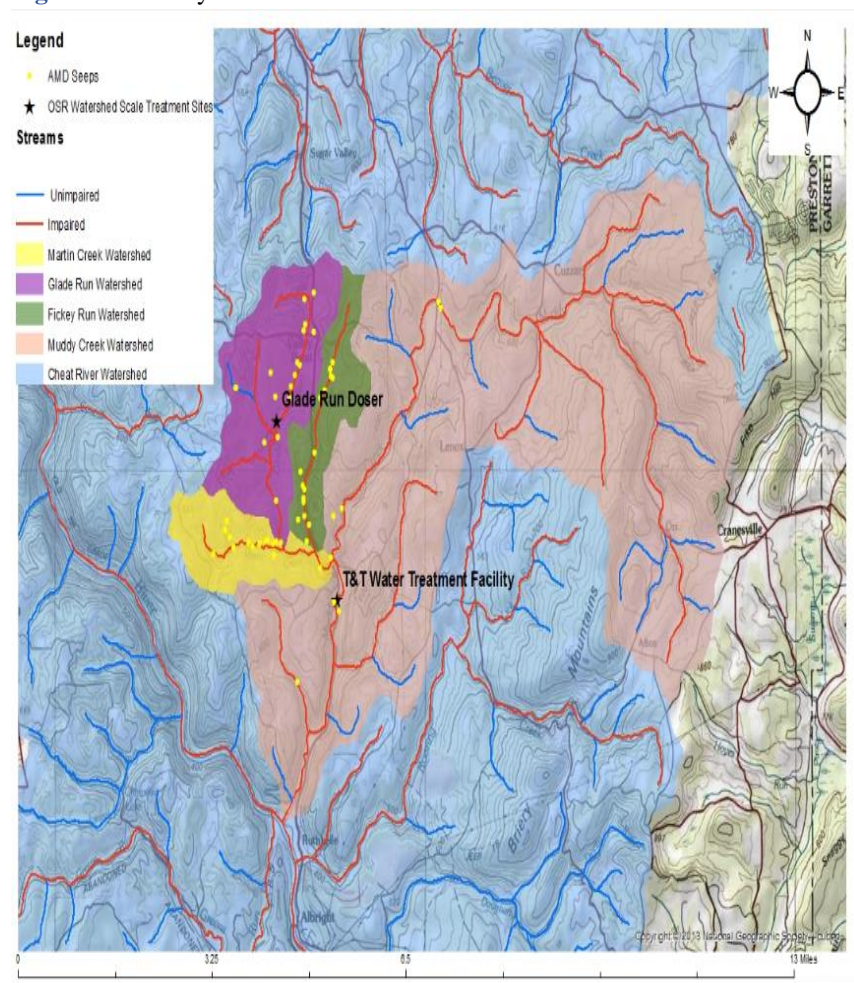
Muddy Creek – a story of partnership and restoration

Developed for [US EPA's 50th Anniversary](#).

West Virginia is known as the “Almost Heaven” state – a desired destination for anyone wanting to experience its incredible beauty and stunning scenic views. The state is an attraction for fishermen, nature lovers, and world-class whitewater rafting enthusiasts. West Virginia’s beautiful state parks, forests, rivers, lakes, and streams are the natural resources that help define its “Almost Heaven” name. So, when the integrity of Muddy Creek was in jeopardy, it received state-wide attention.

The Muddy Creek watershed, located in Preston County, WV encompasses nearly 21,500 acres and joins the Cheat River near Albright, West Virginia. Muddy Creek had been severely impacted by acid mine drainage (AMD) and was the largest source of pollution for the whole Cheat River. The following story demonstrates how coordinated efforts of partners restored Muddy Creek and benefited the Lower Cheat River.

Figure 12. Muddy Creek watershed



In 1994, the first of two incidents turned the waters orange for miles, destroying aquatic life and bringing attention to the problems of AMD. Torrents of polluted water from an underground mine blew out a hillside and poured into Muddy Creek and then the Cheat River, turning the river orange for 16 miles on the way to Cheat Lake. The devastation killed all aquatic life in its path. The results were not all negative because of the attention generated but more importantly, the disaster resulted in the formation of Friends of the Cheat (FOC), one of the most successful watershed groups in West Virginia.

Unfortunately, in 1995, another mine blowout added AMD, contributing to an already devastating situation.

In the years since the blowouts, Multiple sections/offices within WVDEP, FOC, Southwestern Energy, OSM and many other

members of the [River of Promise](#) (ROP) have worked tirelessly to restore Muddy Creek as well as other dozens of other AMD impacted streams within the Cheat River watershed.

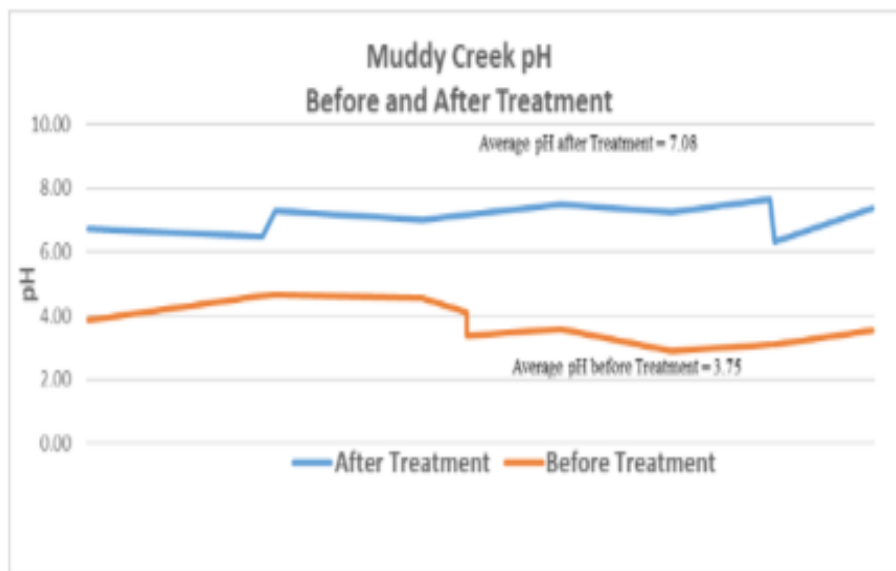


Aerial photo 1994 Mine Blowout - Photo Credit Randy Robinson

The ROP team along with the US EPA determined that the best way to treat the pollution problem was to look at the entire watershed holistically rather than treat individual pollution sources. Thus, US EPA Region III worked with WVDEP to develop a first-of-its-kind permit in West Virginia to neutralize acidity, reduce metals and improve water quality.

This innovative permitting strategy allowed for contaminated water flowing from several streams to be treated via an in-stream dosing or conveyed through the AMD water collection system to the treatment facility by which a yellow-orange sludge separates during the decontamination process and is safely disposed. The water is decontaminated through a process using lime slurry, polymers, and clarifiers to raise the pH and remove the metal substances. It is then returned to the watershed through a single outlet where clean fresh water returns to the stream in a continuous flow that dilutes and gradually restores the creek and river to a life-supportive pH balance – a range of 6.5 to 7.5.

Figure 13. Muddy Creek water quality summary



Since treatment began, Muddy Creek (and Cheat River's) water quality has improved, according to results gathered in recent monitoring surveys. Muddy Creek now holds a net alkaline measurement indicative of a healthier watershed. Inspectors have spotted brown trout in Muddy Creek for the first time in several decades.

This project is an ongoing study requiring more surveys and data to be collected to fully assess the biological recovery of

Muddy Creek. The success of this project is largely due to the result of a decision among regulators, scientists, and the local conservation group to treat the pollution problem as an entire watershed. To learn even more about Muddy Creek visit FOC's [Muddy Creek StoryMap](#).



Integrating Source Water Protection and Watershed Based Plans: A Pilot Project Success Story

Protecting Drinking Water and Improving Watershed Health

This pilot project successfully sought to develop an effective model for efficient co-implementation of priority practices identified in Source Water Protection Plans (SWPPs) and Watershed Based Plans (WBPs) in two watersheds. This project serves as an example of how community organizations, state agencies, and watershed groups can partner with water utilities to protect drinking water and improve water quality.

Problem

In 2014 the Elk River chemical contamination was an alarming reminder of the vulnerability of our water sources. In response, the WV Legislature passed SB 373, which requires most water utilities across the state to have SWPPs. As nonpoint sources pose a predominant threat to drinking water supplies, many of the source water protection strategies are attempting to manage nonpoint sources of pollution. Now that SWPPs are in place across the state, in many cases there is a direct link between SWPP strategies and WBP strategies. Overlap of these two plans, where applicable, offers a unique opportunity to address nonpoint source pollution and source water protection together. This pilot project aligns those plans, and in doing so, helps to strengthen the community connections between water utilities, their customers, and citizens of their source water protection area.

Project highlights

Community engagement and collaboration

In the Elks Run watershed, a dedicated group of partners drove the project's success, including sustained engagement from Harpers Ferry Water Works, [Elks Run Watershed Association](#) (ERWA) WV Department of Health and Human Resources (WVDHHR) Bureau of Public Health, WVDEP, the regional [Planning and Development Council](#), [Harpers Ferry Merchants Association](#), and WVCA. WV Rivers found that cross promotion and collaboration on events yielded additional relationships to enhance project work.

Development of the overlap matrix

One of the key processes developed through these pilot projects, was the overlap matrix. The overlap matrix is a table created from the practices and management strategies articulated in a watershed's WBP and the SWPP of the water utility serving that watershed. The overlap matrix is a powerful tool to provide a roadmap for co-implementation of overlapping strategies. Strategies marked with **D** have direct overlap between both plans. Strategies with a **I** are not expressly stated in both plans, but the strategies do meet the intent of both plans. The matrix is provided in [Figure 15](#).

Community projects

A variety of community projects were completed that supported the co-implementation and provided the public with a better understanding of watershed management planning, and how WBPs and SWPPs are related.

Figure 14. SWWP-WBP project basins

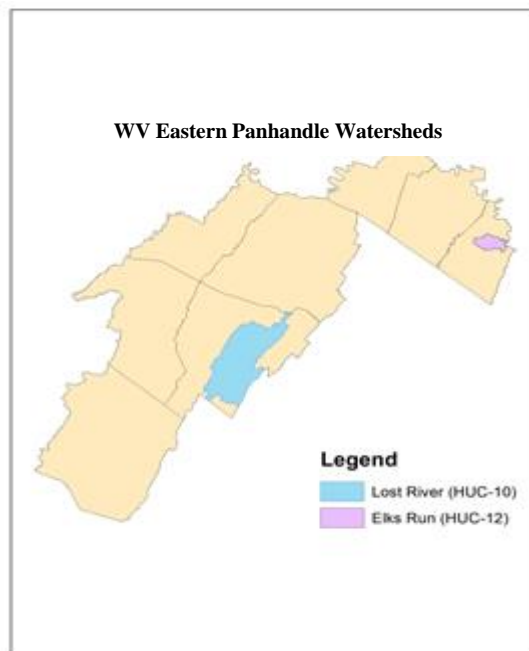


Figure 15. Elks Run overlay matrix.

Pollutant	Landuse	WBP Practices	SWPP PSSC's					Edu. & Outreach			
			Railroads	Agriculture	Septics & Sewer	Commercial & Ind.	Subdivisions	Climate Change	ICPWA Partnership	BMP Lists	Clean up Events
Fecal Coliform	Residential/Urban	Filters			I	I					
		Vegetated Open Channels			I	I					
		Bioretention			I	I					
		Permeable Pavement & Pavers			I	I					
		Infiltration Trenches & Basins			I	I					
		Urban Wet Ponds			I	I	I				
		Urban Wetlands			I	I					
		Impervious Surface Reduction			I	D					
		Pet Waste Runoff Campaign			I	I					
		Rehabilitation of Drainage			I	I					
	Pasture	Grass Buffer*		D							
		Riparian Forest Buffer*		D			I				
		Livestock fencing		D							
		Alternative Water Sources									
		Armored Stream Crossing		I							
		Wetland Restoration*		I			I				
		Wetland Creation*		I			I				
	Cropland*	Nutrient Management Plan		D							
		Manure Composting		D							
		Increased Soil Testing		D							
		Manure Storage Structure		I							
		Manure Transport		I							
		Others, described above	N/A	N/A	N/A	N/A	N/A	N/A			
	Onsite Sewer Systems	Septic ID & Inspection			D						
		Septic Pumping			I						
		Septic Repair			I						
		Septic Replacement			I						
		Sewer Line Extension			D						
Sediment	Residential/Urban	Described above	N/A	N/A	N/A	N/A	N/A	N/A			
	Pasture	Described above	N/A	N/A	N/A	N/A	N/A	N/A			
	Cropland	Conservation Till		I							
		Cereal Cover Crops		D							
		Commodity Cover Crops		D							
		Others, described above	N/A	N/A	N/A	N/A	N/A	N/A			
	Barren Areas	Silt Fencing									
Ches. Bay	Onsite Sewer Systems	De-nitrifying Septic Systems			I						
Forest Cover	Forests	Afforestation		D		I	I	I			
		Land Conservation		D			D	I			
Education - "first step in achieving clean water is to educate residents"		Workshops						I			
		Pet Waste Runoff Campaign							I		
		Watershed Walks							I		
		Subdivision Stormwater Audit							I		
		Water Bill Inserts								I	
		Youth Education								D	D
		Demo Rain Gardens									

Community project examples

Community movie night: Free outdoor movie screenings were held in the summer of 2018 in collaboration with Jefferson County Parks and Recreation. Showings included a source water protection PSA and information on local watershed organizations.

Water Bill inserts: Multiple water bill inserts by Harpers Ferry Water Works educated customers on what they can do to reduce nonpoint source pollution. A total of 800 water customers were reached through three mailings.

Watershed education: Support the development of a watershed education experience partnership between [Potomac Valley Audubon Society](#) (PVAS) and Morgan Academy. WV Rivers also partnered with PVAS to create a watershed education series for kids learning at home due to the Covid-19 pandemic: In total, 200 students participated in these educational activities.

Water Faire: The Water Faire event was debuted and hosted by the Harpers Ferry Merchants Association for two consecutive years.

Septic pumping: A septic pumping project in collaboration with the EPCD provided free

septic pumping to 22 households in the Elks Run watershed. This project included source water protection educational outreach to 474 homes in the Elk Run watershed to advertise the opportunity. At the close of the septic project, multiple homeowners indicated interest in joining ERWA.

Results

There are three high-level outcomes of this project:

1. Creation of an integrated SWPP/WBP for two pilot project watersheds, plus the Tuscarora Creek watershed.
2. Inclusion of the outcome matrix in a WBP revision/update; and
3. Sharing our methods with the larger NPS community.

A key result of the pilot project is the creation of a blueprint for collaboration and community engagement in the overlap of SWPP and WBP management strategies to

Lesson 3: Run-off and Erosion



protect drinking water and improve watershed health. An integrated plan is the culmination of stakeholder efforts in coordinating the co-implementation of the WBP and SWPP for the Elks Run watershed. It contains the overlap matrix identified in stakeholder discussions, a list of the priority practices already completed, and a list of proposed projects (currently underway). The matrix documents were the main drivers for community conversations in the Elks Run watershed, the Lost River watershed, and Tuscarora Creek. The Elks Run overlay matrix was the most successful for future project planning. Stakeholder interest was more challenging in Lost River, but the effort did result in a matrix. An overlay matrix was also developed by the Tuscarora Creek project team will be incorporated into the next WBP revision. WV Rivers presented at the [*National Nonpoint Source Conference*](#) on this pilot project in November 2020.

Funding and partners

Table 13. WV Rivers funding and key partners

\$319 funds	Budgeted	Actual	Key partners Alliance for the Chesapeake Bay, Cacapon Institute, Cacapon and Lost Rivers Land Trust, EPCD, ERWA, Friends of the Cacapon River, Hardy County Government, Hardy County Public Service District, Harpers Ferry Merchant Association, Harpers Ferry Town Council, Harpers Ferry Water Board, Harpers Ferry Water Commission, Harpers Ferry Water Works, Morgan Academy Middle School, National Park Service, Potomac Valley Audubon Society, Region 9 Planning and Development, Ten Fold Fair Trade, The Downstream Project, True Treats Candies, Tuscarora Creek Project Team, WV Bureau of Public Health, WVCA, WVDEP-WIB, WV Rural Water Association
	\$100,000	\$100,000	
Match	\$ 66,968	\$66,968	
Total	\$ 66,968	\$66,968	
Matching fund sources			
WV DHHR, Land Trust Alliance Land and Water Initiative, Potomac Riverkeeper SEP Award, private foundations, and individual donations.			

Browns Creek testimonial

“First I’d like to take the opportunity to say thank you for the work you have begun, helping to clean up the rivers and creeks. I was very happy to hear that my project was approved and I was accepted into the program. The process was explained to me by Justin and I immediately began searching for three qualified installers to complete my job. I had it down to three options and two of them had bid near the full allotted amount supplied by the grant and the 3rd was almost \$2000 less. I liked the idea that I could get my system replaced and leave some extra money available for the next guy. Then I had my system installed and as luck would have it the low bidder did not do a proper installation of my tank, the chambers, my downspout drain that he dug out and “replaced” my lawn looked like a horribly plowed field, I contacted the installer several times (as did Justin) and basically was told that he wasn’t coming back out unless he was paid (again) he also said in response to being notified that the top of the tank was partially collapsed and that the downspout drain had failed that it “wasn’t his fault that the ground settled”. So fast forward a few months and I had “gray water” coming back up in my yard (which was the reason I was approved for the replacement in the beginning). Soon I was notified by Justin that my project was going to be looked at for a possible repair. After it was looked at Justin called and said that it was in fact going to be repaired . It has since been replaced with an aeration system that was installed by McVay’s Innovative Septic Systems which appears to have corrected the issues that were left by the previous installer. I feel that this program is a very worthwhile attempt to clean up the creeks and rivers in areas that aren’t serviced by modern sewer systems. I wish to convey my sincerity in saying that I truly appreciate the CRG’s Justin Hunt and everyone that played a part in this project and I intend to assist in informing others in this area about the benefits of this program.” - *Kenny R. Romine*

Figure 16. Photo-log of septic installation troubles.

Before



After

